MA3025 (5-1) Logic and Discrete Mathematics
Syllabus

Coordinator: Craig Rasmussen
Prerequisite: MA1025, or equivalent exposure to elementary propositional and predicate logic and mathematical proof.
Current Text (Fall 2003): *Discrete Mathematics and Its Applications*, 5th Edition, K.H. Rosen, WCB/McGraw-Hill 2003, ISBN 0-07-242434-6.

MA3025 is designed to provide a foundation in logic and elementary discrete mathematics. The course is useful for students from a number of disciplines, but has been specifically tailored for students of computer science. The emphases are twofold: the course begins with an informal review of "naive" propositional and first-order predicate logic, then explores the way in which the logic is applied in some fundamental areas of mathematics that are relevant to the study of both mathematics and computer science. Topics from logic include truth tables, predicates, quantifiers, and inference rules. Additional mathematical topics include elements of set theory, mathematical induction, relations and functions, number theory, and probability.

Following is a typical schedule for the coverage of topics, keyed to Rosen's text.

Hours	Sections	Topics
5-5	1.1–1.4	Review: Logic, Propositional Equivalence, Predicates, Quantifiers
5-10	1.5–1.8	Methods of Proof, Sets and Set Operations, Functions
3-13	2.4, 2.5	Integers and Division, Euclidean Algorithm
2-15	3.2	Sequences and Summations
4-19	3.3	Mathematical Induction
5-24	4.1–4.3	Basics of Counting, Pigeonhole Principle, Permutations/Combinations
5-29	4.4–4.6	Binomial Theorem, Generalized Permutations/Combinations
2-31	5.5,5.6	Inclusion/Exclusion
5-36	5.1–5.3	Probability Theory: Sample Spaces, Events, Independence, Expectation
4-40	Handout	Discrete Random Variables: Definitions, Expectation, Distribution Functions
4-44	7.1-7.3	Relations: Properties, Applications, Representations
4-48	7.4–7.6	Closures, Equivalence Relations and Partial Orders
7-55		Review, Exams, Holidays